

- (b) Derive the condition of most economical rectangular channel section. **5**

6. (a) Obtain the expression for the force exerted by a jet of water on a moving vertical plate in the direction of jet with velocity  $u$ . **10**
- (b) What do you understand by gradually varied flow ? **5**

#### Unit IV

7. (a) Describe the terms—slip, percentage of slip and negative slip of a reciprocating pump. **6**
- (b) Explain various parts and working of centrifugal pump. **9**
8. Write short notes on any *three* of the following :
- (i) Impeller of centrifugal pump
  - (ii) Priming
  - (iii) Impulse turbine
  - (iv) Breaking jet. **15**

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**B. Tech. EXAMINATION, May 2018**

(Fourth Semester)

(B. Scheme) (Main & Re-appear)

(CE)

CE204B

OPEN CHANNEL FLOW

*Time : 3 Hours]*

*[Maximum Marks : 75*

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Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

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**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit. Assume any data if missing.

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P.T.O.

### Unit I

1. (a) A flow of water of 100 ltrs per second flows down in a 300 mm deep rectangular flume of width 600 mm having adjustable bottom slope. If Chezy's  $C = 56$ , find the bottom slope necessary for uniform flow. Also find  $K$  value for the flume. **8**
- (b) Explain the following : **7**
  - (i) Uniform flow and Non-uniform flow
  - (ii) Gradually varied flow.
2. (a) What are the advantages of triangular notch over rectangular notch ? **5**
- (b) A right angle V notch is used for measuring a discharge of 30 ltrs/sec. An error of 1.5 mm was made while measuring the head over the notch. Calculate the percentage error in the discharge. Take  $C_d = 0.62$ . **10**

### Unit II

3. (a) Explain the term hydraulic jump. Write down the application of hydraulic jump. **6**

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- (b) Explain the terms : **9**

- (i) Specific energy
- (ii) Minimum specific energy
- (iii) Critical depth
- (iv) Critical velocity.

4. (a) What is specific energy curve ? Draw specific energy curve, and then derive expressions for critical depth and critical velocity. **8**
- (b) The specific energy for a 5m wide rectangular channel is to be 4 Nm/N. If the rate of flow of water through the channel is  $20 \text{ m}^3/\text{s}$ , determine the alternate depths of flow. **7**

### Unit III

5. (a) A trapezoidal channel with side slopes of 3H to 2V has to be designed to convey  $10 \text{ m}^3/\text{s}$  at a velocity of 1.5 m/s, so that the amount of concrete lining for the bed is minimum. Find the wetted parameter and slope of bed by assuming Manning's  $N = 0.014$ . **10**

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P.T.O.